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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/659,342	09/11/2003	Atsushi Kawamura	242612US2	7085

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EXAMINER	
DINH, JACK	

ART UNIT	PAPER NUMBER
2873	

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

EK

Office Action Summary	Application No.	Applicant(s)	
	10/659,342	KAWAMURA, ATSUSHI	
	Examiner	Art Unit	
	Jack Dinh	2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 January 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) *14-19* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *0204*.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. *0405* .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *DETAILED ACTION*.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-13 in the reply filed on 01/31/05 is acknowledged.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, lines 10-11, and claim 10, lines 12-13, the phrase "so that imaging surfaces in the first and second directions match" renders the claim indefinite. It is unclear as to what configuration of the optical system would be required to satisfy such condition. For examination purposes, to satisfy such condition, the rejections below are based simply on the claimed configuration of an optical system comprising at least two anamorphic surfaces each having radii of curvature which are different on an object surface in the first direction and a second direction which is perpendicular to the first direction. In addition, the preamble clause of claim 1, from lines 1-6 does not appear to be written with proper grammar. It is respectfully requested that the Applicant fully rewrite the claims to overcome the above matters to further

clarifying the claimed subject matter. Claims 2-9 and 11-13 are rejected based upon the rejected claims.

Regarding claim 3, lines 6-7, the phrase "non-arcuate shape is variable" renders the claim indefinite. A shape is either arcuate or non-arcuate. Curvature-wise speaking, non-arcuate shape is understood to be fixed. Therefore, it is unclear what feature of the non-arcuate shape is variable.

Regarding claim 5, line 2, there is no reference designation represents "principle point". Therefore, it is unclear of the geometry being claimed.

Regarding claim 6, lines 3-4, the phrase "on a side closer to the light modulator element" renders the claim indefinite. It is unclear of the claimed configuration wherein the optical system is approximately telecentric in the first direction "on a side closer to the light modulator element".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant's admitted prior art in view of Nakashima et al. (US Patent 5,652,611).

Regarding claim 1, the Applicant's admitted prior art (specification, page 4, line 1- page 5, line 8) is interpreted as disclosing an imaging optical system for imaging a one-dimensional image on an image surface by regarding as an object a light modulator element which has light modulator parts arranged one-dimensionally in a first direction, and regarding a bundle of rays from the light modulator element as an object light. The Applicant's admitted prior art is interpreted as disclosing all the claimed limitations except that the optical system comprising at least two anamorphic surfaces each having radii of curvature which are different on an object surface in the first direction and a second direction which is perpendicular to the first direction. Within the same field of endeavor, Nakashima (figure 13B) is interpreted as disclosing imaging optical system comprising two anamorphic surfaces **45a** and **45b** each having radii of curvature which are different on an object surface in the first direction and a second direction which is perpendicular to the first direction (col. 10, lines 26-44). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide an optical system with two anamorphic surfaces each having radii of curvature which are different on an object surface in the first direction and a second direction which is perpendicular to the first direction, as taught by Nakashima, for the purpose of matching the image surfaces in the first and second directions.

Regarding claim 10, the Applicant's admitted prior art (specification, page 4, line 1 – page 5, line 8) is interpreted as disclosing an image display apparatus comprising a light modulator element which has light modulator parts arranged one-dimensionally in a first direction, an imaging optical system to image a one-dimensional image on an image surface by regarding the light modulator element as an object and regarding a bundle of rays from the light modulator element as an object light, a display section to display an image on a display surface by imaging the one-dimensional image on the display surface via the imaging optical system and relatively scanning the one-dimensional image and the display surface in the direction perpendicular to a longitudinal direction of the one-dimensional image. The Applicant's admitted prior art is interpreted as disclosing all the claimed limitations except that the optical system comprising at least two anamorphic surfaces each having radii of curvature which are different on an object surface in the first direction and a second direction which is perpendicular to the first direction. Within the same field of endeavor, Nakashima (figure 13B) is interpreted as disclosing imaging optical system comprising two anamorphic surfaces **45a** and **45b** each having radii of curvature which are different on an object surface in the first direction and a second direction which is perpendicular to the first direction (col. 10, lines 26-44). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide an optical system with two anamorphic surfaces each having radii of curvature which are different on an object surface in the first direction and a second direction which is perpendicular to the first direction, as taught by Nakashima, for the purpose of matching the image surfaces in the first and second directions.

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant's admitted prior art in view of Nakashima et al. (US Patent 5,652,611), as applied in claim 1, in view of Rappette et al. (US Patent 6,178,254).

Regarding claim 4, the Applicant's admitted prior art in view of Nakashima is interpreted as disclosing all the claimed limitations, as described above, except for explicitly stating that the imaging magnification Mv in the first direction and the imaging magnification Mh in the second direction satisfy the relationship $|Mv/Mh| > 1$. Within the same field of endeavor, Rapette is interpreted as disclosing the teaching of an anamorphic lens with this property (col. 6, lines 20-22). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide an anamorphic lens with such property, as taught by Rappette, for the purpose of improving pixel efficiency.

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant's admitted prior art in view of Nakashima et al. (US Patent 5,652,611), as applied in claim 1, in view of Sato (US Patent 6,072,636).

Regarding claim 7, the Applicant's admitted prior art in view of Nakashima is interpreted as disclosing all the claimed limitations, as described above, except for a stopper arranged closer to the imaging surface. Within the same field of endeavor, Sato (figure 1) is interpreted as disclosing an anamorphic lens system wherein the stopper **3** is arranged closer to the imaging side. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to arrange the stopper closer to the imaging side, as taught by Sato, for the purpose of providing the so-called front stopper.

6. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant's admitted prior art in view of Nakashima et al. (US Patent 5,652,611), as applied in claim 10, in view of Hayashi et al. (US Patent 6,317,246).

Regarding claim 13, the Applicant's admitted prior art in view of Nakashima is interpreted as disclosing all the claimed limitations, as described above, except for a deflecting section and a curvature of field correcting optical system. However, both of these components are well known in optical scanning. Within the same field of endeavor, Hayashi (figure 1) is interpreted as disclosing a deflecting section **16** to deflect an imaged ray obtained via the imaging optical system, so as to scan the image with respect to the display surface, and a curvature of field correcting optical system **17** disposed between the deflecting section and the display surface **18**, to substantially match an image surface of the image deflected and scanned by the deflecting section to the display surface. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a deflecting section, and a curvature of field correcting optical system, as taught by Hayashi, for the purpose of scanning the image with respect to the display surface, and matching an image surface of the image deflected and scanned by the deflecting section to the display surface, respectively.

Allowable Subject Matter

7. Claims 2, 8, 9, 11 and 12 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the

limitations of the base claim and any intervening claims. Regarding claim 2, the prior art fails to disclose an anamorphic surface that has a bent axis toroidal surface with a non-arcuate shape within a cross section cut along the first direction, and a curvature center line of the bent axis toroidal surface formed by joining centers of curvature of cross sections cut along the second direction is a curve. Regarding claim 8, the prior art fails to disclose that at least two of the plurality of lenses have different focal distances in the first and second direction, focal distances which differ in the first and second directions for the entire imaging optical system, and different imaging magnifications on the image surface. Regarding claim 11, the prior art fails to disclose the configuration wherein each of the three light modulator parts with spectral characteristics for red, green and blue arranged one-dimensionally in the first direction and parallel to each other so that each of the three modulators is adjacent to at least one of the three modulators.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jack Dinh whose telephone number is 571-272-2327. The examiner can normally be reached on M-F (9:30 AM - 6:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Y. Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jack Dinh

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